

Summary of Survey 2 Results

GREAT LAKES (REGION 1)

*Objective of Survey 2: To inform the status of specific threats and importance of various conservation actions for **habitats** within individual **planning regions** in Indiana (Elements 3 and 4)*

Survey About Threats to and Conservation Needs for Fish and Wildlife Habitats in Indiana

— In Support of the 2015 Indiana State Wildlife Action Plan—



Flow of Survey 2:

1. Introduction
2. Planning region and habitat selection
3. Status and trends in habitat
4. Threats and trends of threats to habitats
5. Conservation actions for habitats
6. Relative ranking of conservation actions in each planning region
7. Organizational adaptation and evaluation
8. Additional Comments

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Survey 2 Participation Rates

Sent online to directly to 972 conservation professionals, stakeholders, species experts, property managers, etc.

“Open” link provided for other individuals to participate

Recorded 362 full and partial responses

- 285 direct distribution
- 77 open link

	%	N
Great Lakes (Region 1)	30.1%	87
Kankakee (Region 2)	21.8%	63
Corn Belt (Region 3)	43.9%	127
Valleys and Hills (Region 4)	21.1%	61
Interior Plateau (Region 5)	27.7%	80
Drift Plains (Region 6)	18.7%	54
None of these	7.3%	21

Major Habitat Types

Aquatic systems: All water habitats, both flowing and stationary, excluding wetlands.

Agricultural lands: Lands devoted to commodity production, including intensively managed nonnative grasses, row crops, fruit and nut-bearing trees.

Barren lands: Lands dominated by exposed rock or minerals with sparse vegetation, including *glades*.

Developed lands: Highly impacted lands, intensively modified to support human habitation, transportation, commerce, and recreation.

Forests: A plant community extending over a large area and dominated by trees, the crowns of which form an unbroken covering layer or canopy.

Grasslands: Open area dominated by grass species, for example, prairies or reclaimed minelands.

Subterranean systems: Surface openings of subterranean features reaching as far as natural light can penetrate (i.e., twilight zone) and connected underground rooms and passages beyond natural light penetration, including karsts.

Wetlands: Area temporarily or permanently flooded, supporting woody and/or herbaceous vegetation.

For which of the following SWAP planning regions do you consider yourself knowledgeable to provide information on the status of, threats to, and relevant conservation actions for fish and wildlife habitats?

Habitat type:	Proportion of respondents:	N:
Aquatic systems	65.1%	56
Agricultural lands	27.9%	8
Barren lands	9.3%	8
Developed Lands	20.9%	18
Forests	44.2%	38
Grasslands	33.7%	29
Subterranean systems	N/A	N/A
Wetlands	57.0%	49

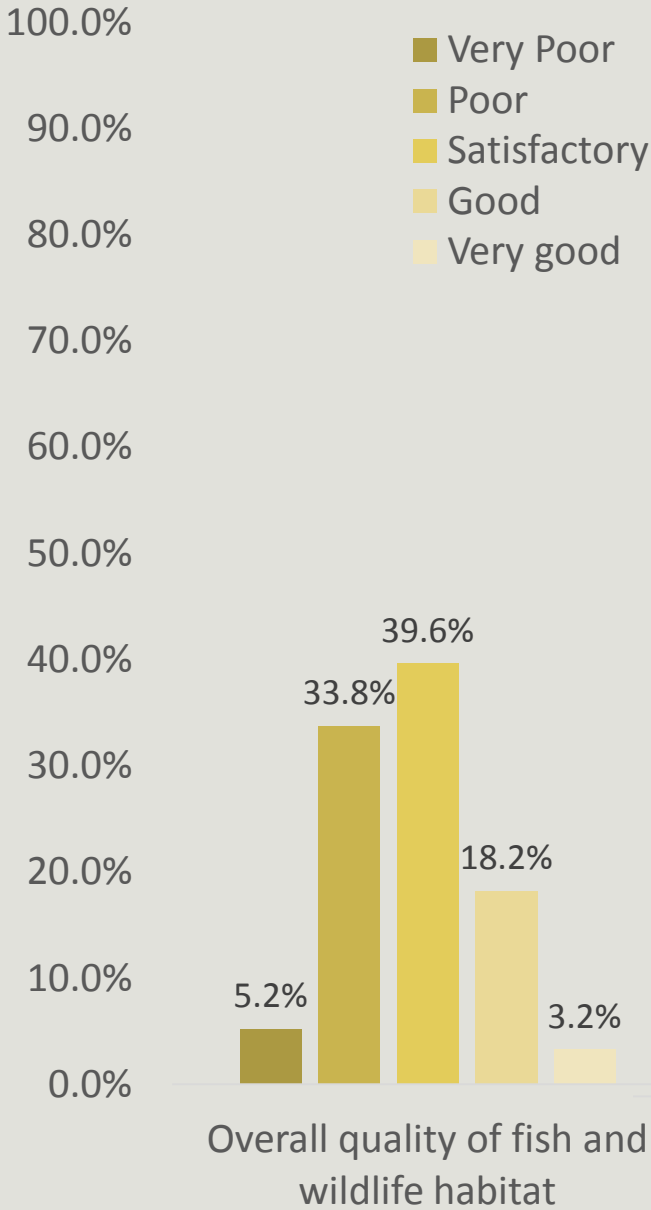
*Summary of trends in **habitat** within the Great Lakes (Region 1)*

11. How would you describe the **overall quality** of fish and wildlife habitats within **HABITAT** in the REGION?

12. How would you describe the total amount and overall quality of fish and wildlife habitats within **HABITAT** in the REGION since 2005?

13. How would you predict about the total amount and overall quality of fish and wildlife habitats within **HABITAT** in the REGION over the next 10 years? (Check one for each line item)

Summary of Habitat Status in the Great Lakes (Region 1)

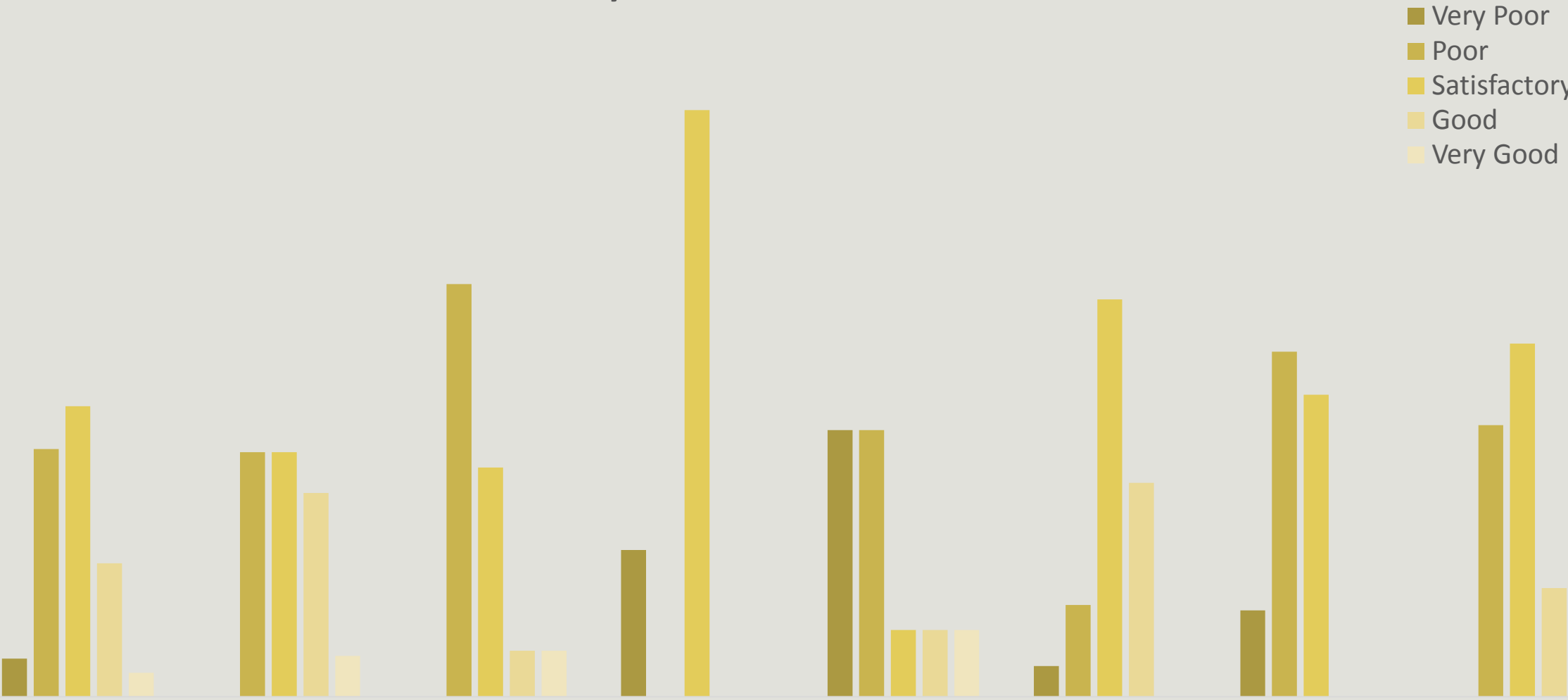


Overall Quality of Fish and Wildlife Habitats

- Very Poor
- Poor
- Satisfactory
- Good
- Very Good

100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%

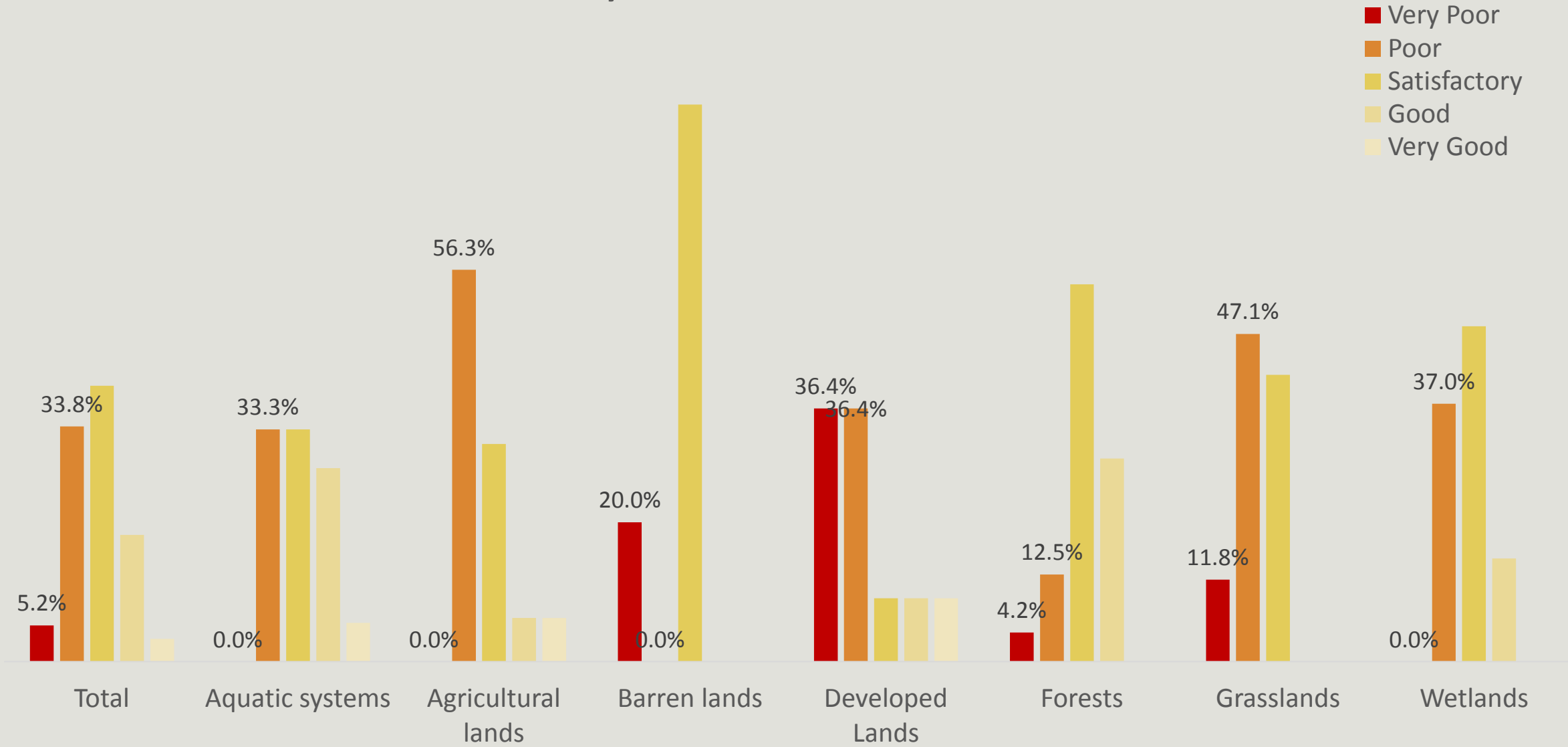
Total Aquatic systems Agricultural lands Barren lands Developed Lands Forests Grasslands Wetlands

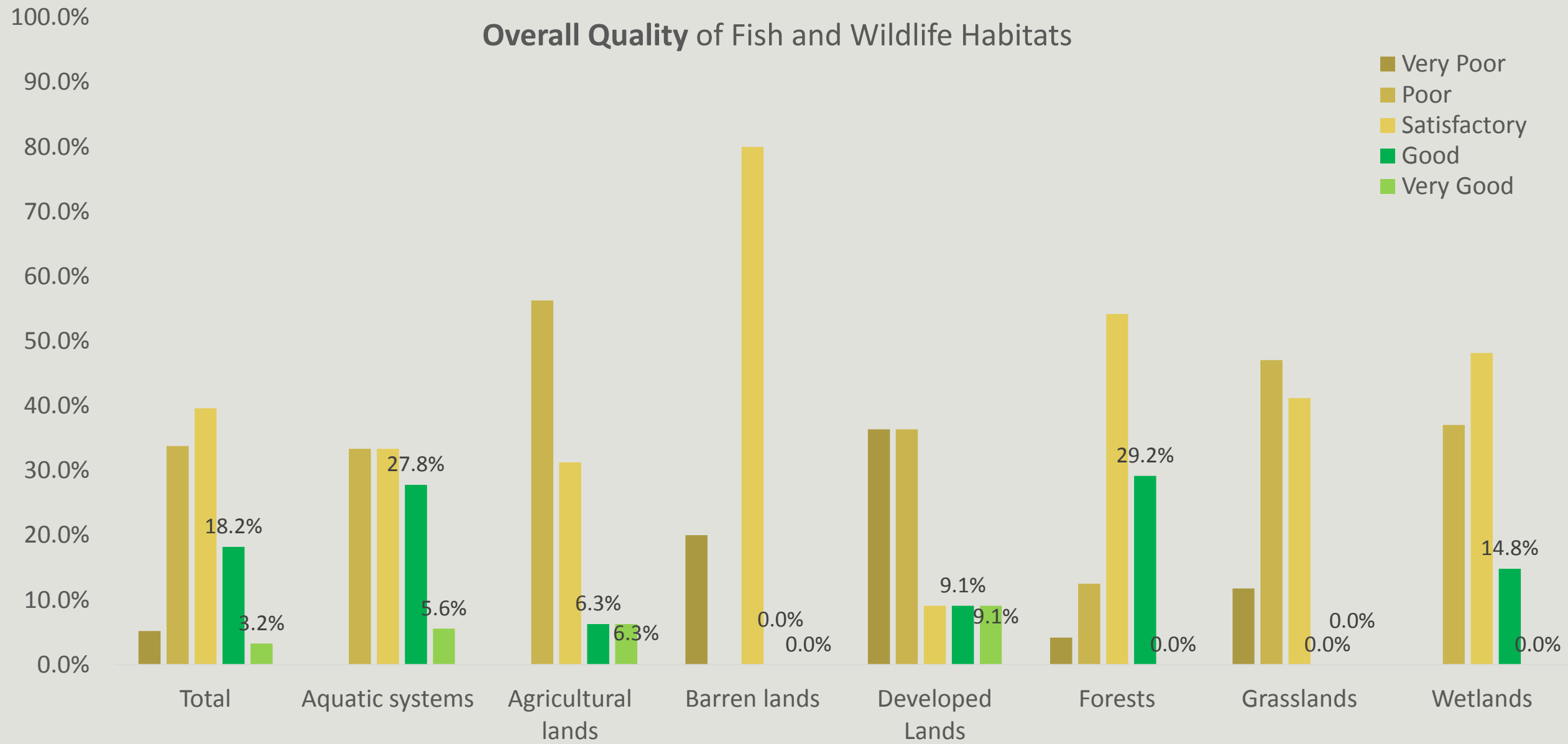


Overall Quality of Fish and Wildlife Habitats

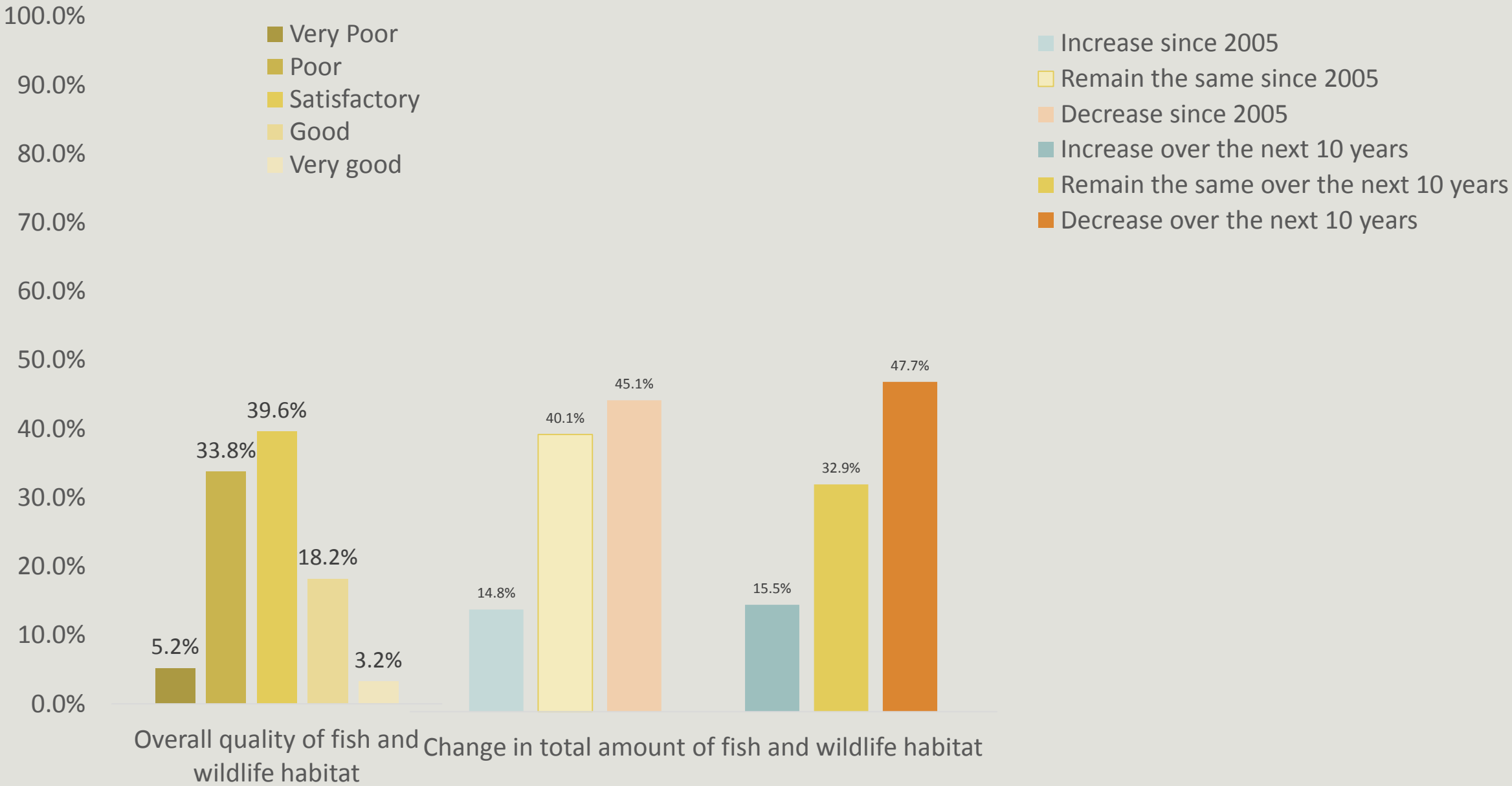
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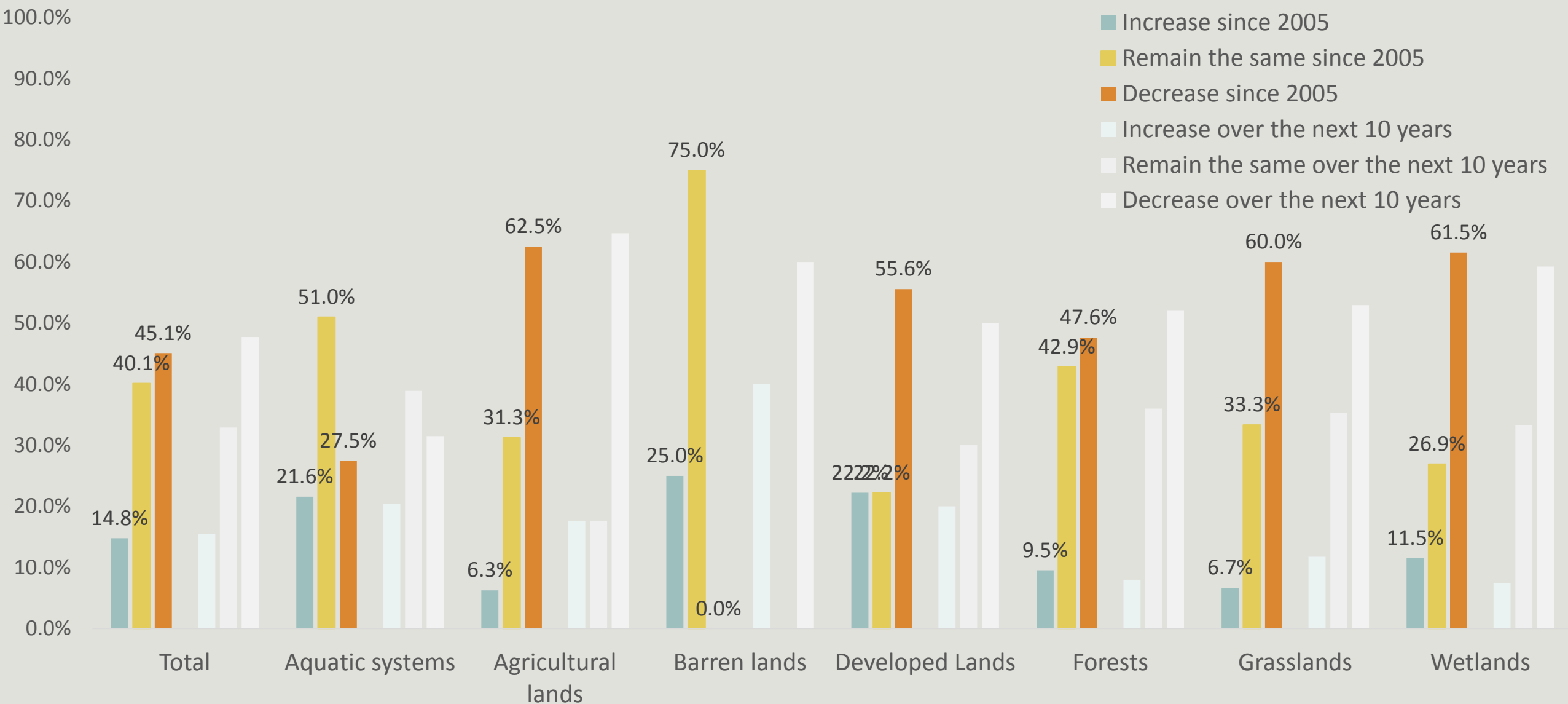




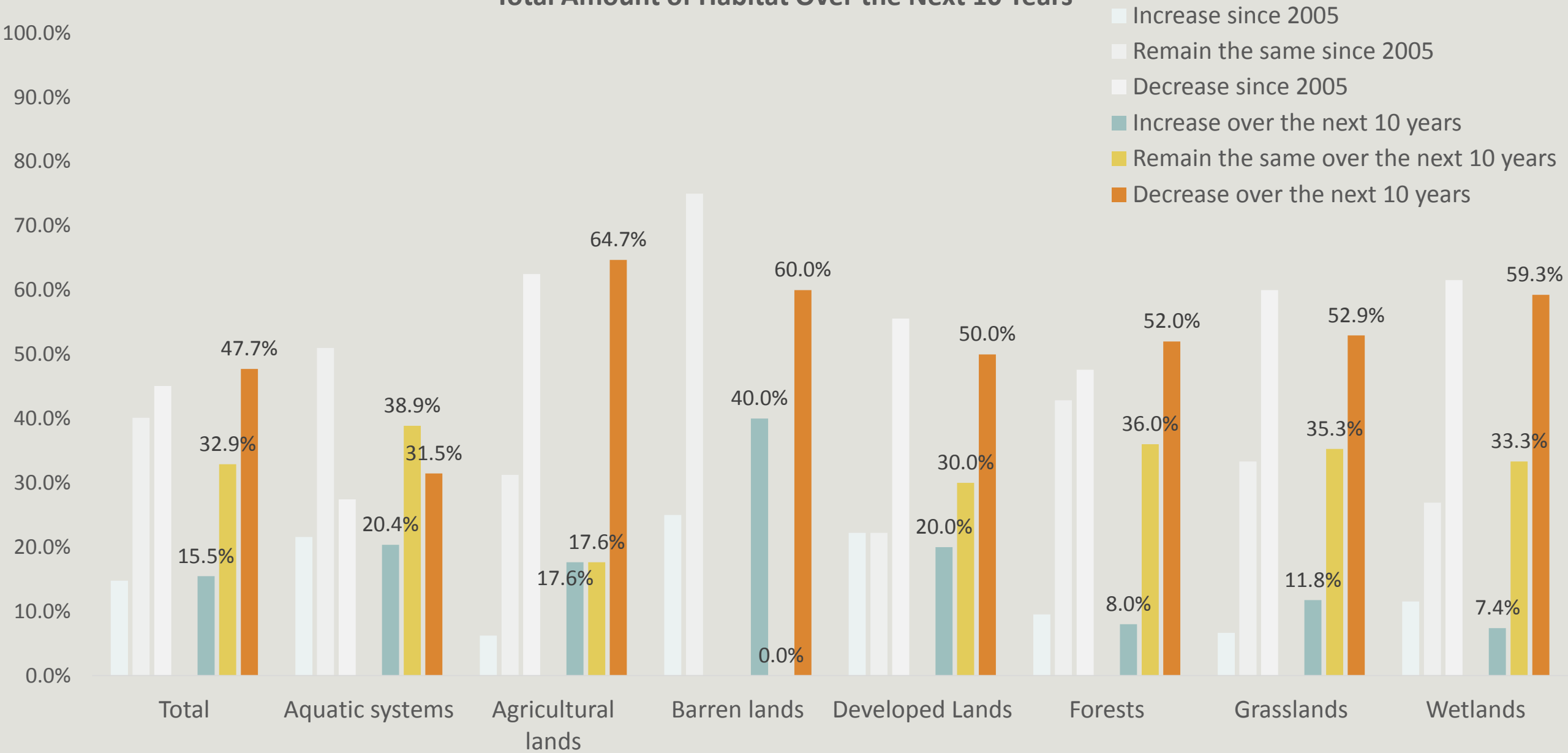
Summary of Habitat Status in the Great Lakes (Region 1)



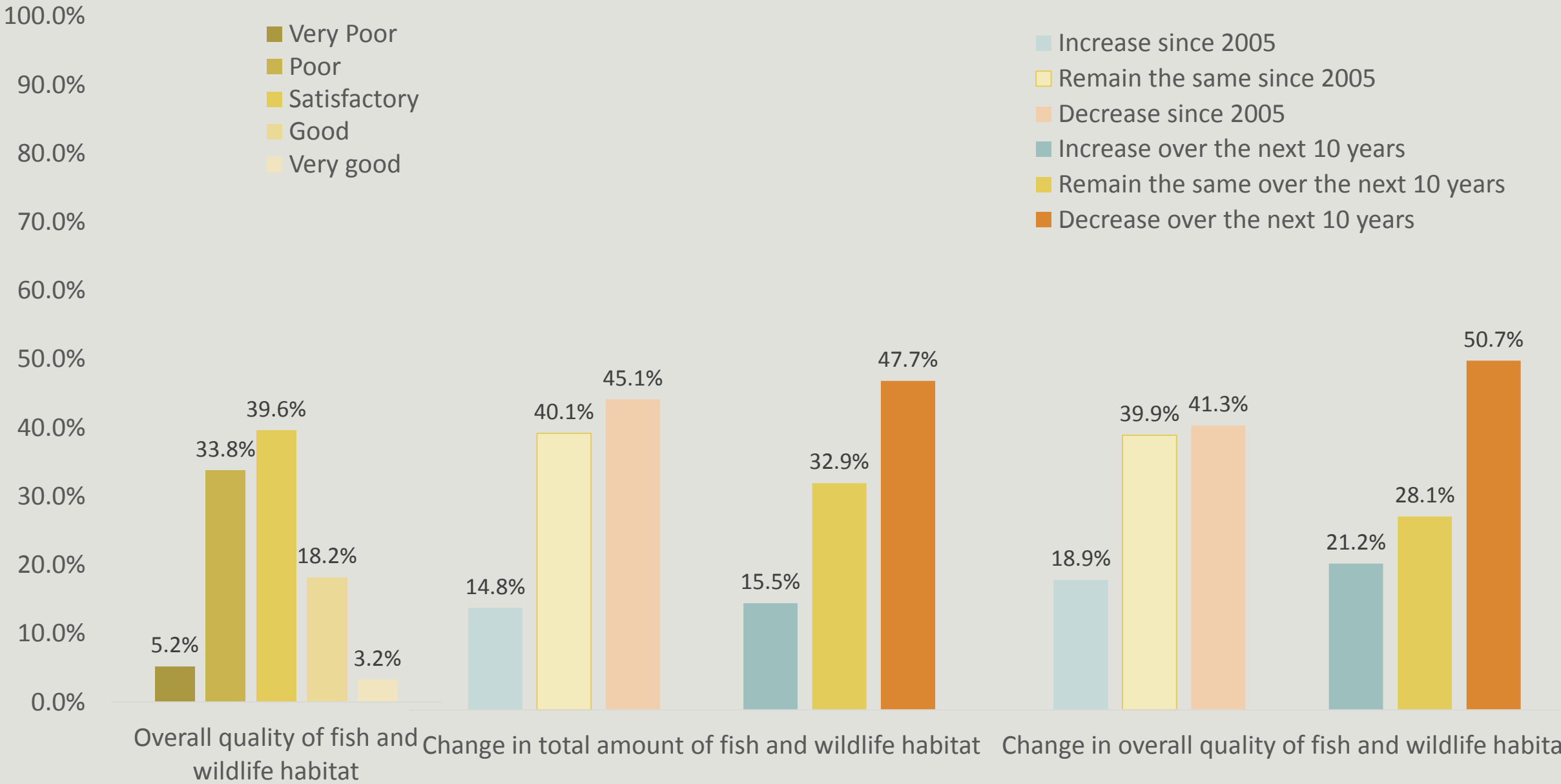
Total Amount of Habitat Since 2005



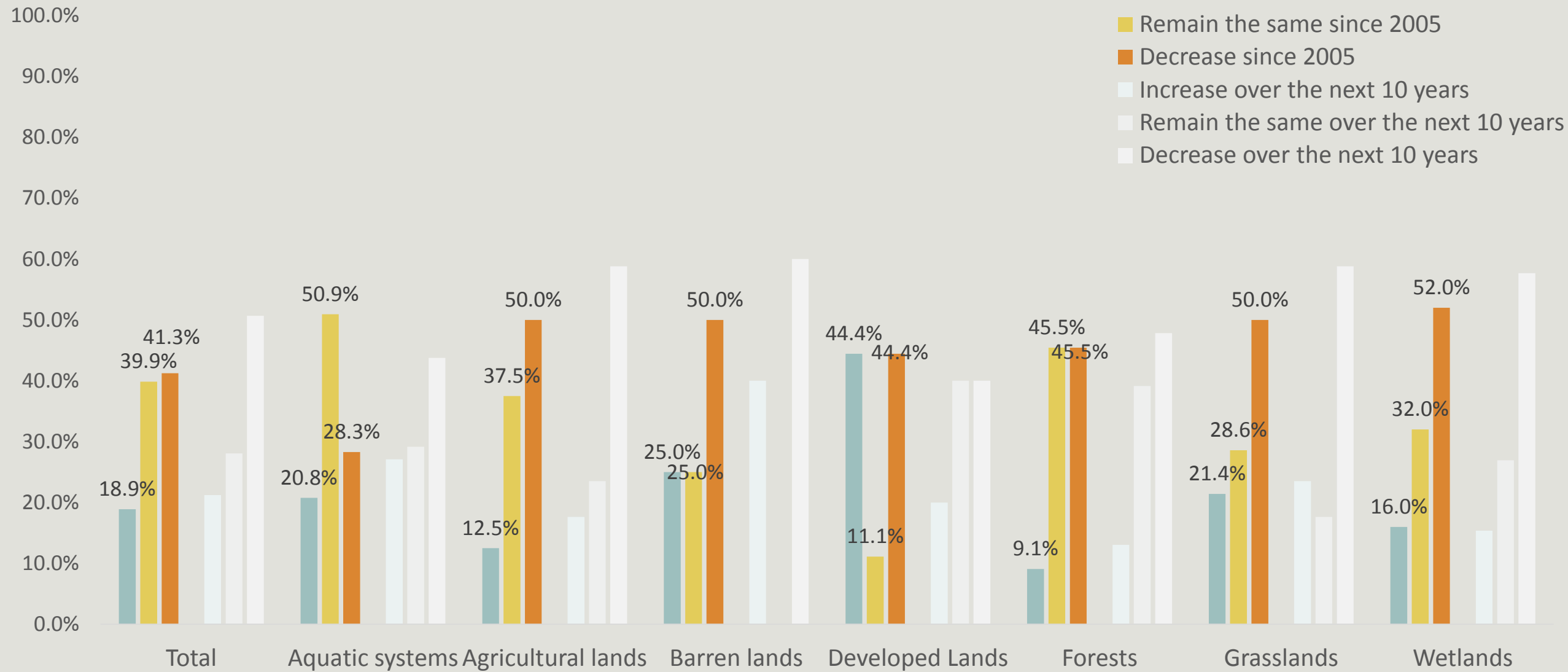
Total Amount of Habitat Over the Next 10 Years



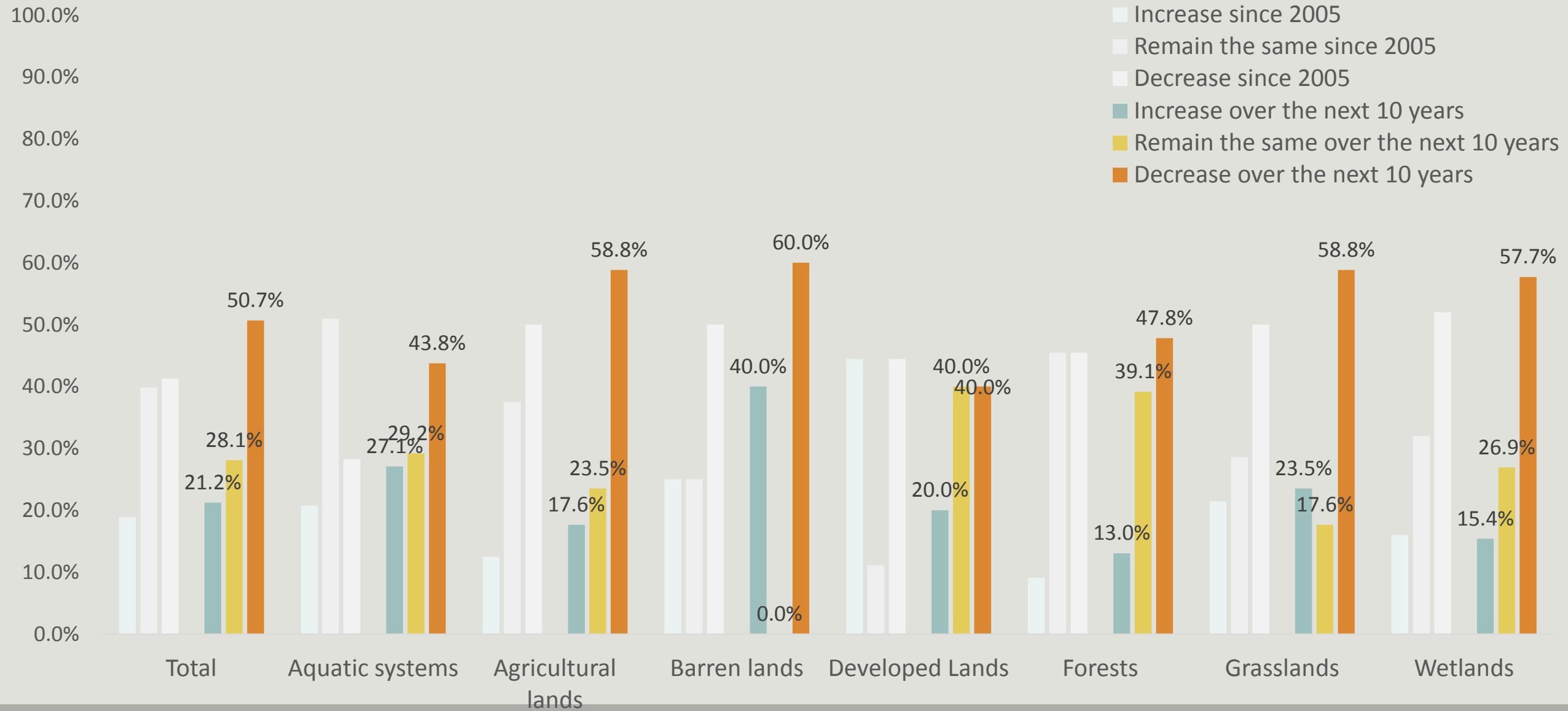
Summary of Habitat Status in the Great Lakes (Region 1)



Overall Quality of Habitat Since 2005



Overall Quality of Habitat Over the Next 10 Years



Threats to Habitats in Great Lakes (Region 1)

Broad Threat Category



Category Ranking



Specific threats, ranking
and anticipated changes

Agriculture and
Aquaculture



Significant Threat



Conversion of habitat to annual crops
Annual and perennial nontimber crops
Livestock farming and ranching
Wood and pulp plantations
Aquaculture

Energy Production and
Mining



Moderate Threat



Mining and quarrying
Fossil fuel energy production
Oil and gas drilling
Shale gas development (e.g., fracking)
Renewable energy production

Residential and
Commercial Development



Minor Threat



Housing and urban areas
Commercial and industrial areas
Tourism and recreation areas (e.g., sites
with a substantial footprint – golf
courses, campgrounds, etc.)

Agriculture and
Aquaculture



Significant Threat



Conversion of habitat to annual crops
Annual and perennial nontimber crops
Livestock farming and ranching
Wood and pulp plantations
Aquaculture



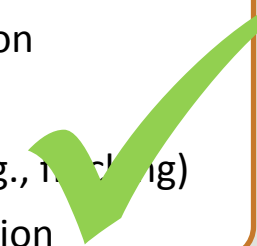
Energy Production and
Mining



Moderate Threat



Mining and quarrying
Fossil fuel energy production
Oil and gas drilling
Shale gas development (e.g., fracking)
Renewable energy production



Residential and
Commercial Development



Minor Threat



Housing and urban areas
Commercial and industrial areas
Tourism and recreation areas (e.g., golf courses, campgrounds, etc.)



Threat Category:	Rating as “significant” or “moderate” threat:	N:
Invasives and other problematic species and genes	97.4%	149
Residential and commercial development	88.8%	135
Natural systems modifications	82.1%	119
Agriculture and aquaculture	81.1%	120
Pollution	78.9%	116
Human intrusion and disturbance	77.8%	112
Climate change and severe weather	65.5%	91
Transportation and service corridors	60.4%	87
Other stressors	51.9%	56
Energy production and mining	35.2%	45
Biological resource use	30.5%	43

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Invasives and other problematic species and genes	97.4%	149
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Energy production and mining	35.2%	45
Biological resource use	30.5%	43

Threat Category:	Entire Region	Aquatic Systems	Agricultural Lands	Barren Lands	Developed Lands	Forests	Grass-lands	Wet-lands
Invasives and other problematic species and genes	1st	1st	1st	1st -Tie	1st -Tie	1st	1st	1st
Residential and commercial development	2nd	3rd	3rd -Tie	1st -Tie	1st -Tie	2nd	4th	2nd
Natural systems modifications	3rd	6th	2nd	6th - Tie	4th - Tie	3rd	2nd	4th
Agriculture and aquaculture	4th	5th	3rd -Tie	8th - Tie	9th	4th	3rd	3rd
Pollution	5th	2nd	5th	3rd -Tie	1st -Tie	8th	7th	5th
Human intrusion and disturbance	6th	4th	7th	6th - Tie	4th - Tie	5th	5th	6th
Climate change and severe weather	7th	7th	6th	5th	7th	7th	6th	8th
Transportation and service corridors	8th	8th	8th	3rd -Tie	4th - Tie	9th	8th	9th
Other stressors	9th	9th	9th	8th - Tie	8th	6th	10th	7th
Energy production and mining	10th	10th	10th	8th - Tie	11th	11th	9th	11th
Biological resource use	11th	11th	11th	11th	10th	10th	11th	10th

Threat Category:	Entire Region	Aquatic Systems	Agricultural Lands	Barren Lands	Developed Lands	Forests	Grass-lands	Wet-lands
Invasives and other problematic species and genes	1st	1st	1st	1st -Tie	1st -Tie	1st	1st	1st
Residential and commercial development	2nd	3rd	3rd -Tie	1st -Tie	1st -Tie	2nd	4th	2nd
Natural systems modifications	3rd	6th	2nd	6th - Tie	4th - Tie	3rd	2nd	4th
Agriculture and aquaculture	4th	5th	3rd -Tie	8th - Tie	9th	4th	3rd	3rd
Pollution	5th	2nd	5th	3rd -Tie	1st -Tie	8th	7th	5th
Human intrusion and disturbance	6th	4th	7th	6th - Tie	4th - Tie	5th	5th	6th
Climate change and severe weather	7th	7th	6th	5th	7th	7th	6th	8th
Transportation and service corridors	8th	8th	8th	3rd -Tie	4th - Tie	9th	8th	9th
Other stressors	9th	9th	9th	8th - Tie	8th	6th	10th	7th
Energy production and mining	10th	10th	10th	8th - Tie	11th	11th	9th	11th
Biological resource use	11th	11th	11th	11th	10th	10th	11th	10th

Highest Ranked Threats

Threat Category:	Entire Region	Aquatic Systems	Agricultural Lands	Barren Lands	Developed Lands	Forests	Grass-lands	Wet-lands
Invasives and other problematic species and genes	1st	1st	1st	1st -Tie	1st -Tie	1st	1st	1st
Residential and commercial development	2nd	3rd	3rd -Tie	1st -Tie	1st -Tie	2nd	4th	2nd
Natural systems modifications	3rd	6th	2nd	6th - Tie	4th - Tie	3rd	2nd	4th
Agriculture and aquaculture	4th	5th	3rd -Tie	8th - Tie	9th	4th	3rd	3rd
Pollution	5th	2nd	5th	3rd -Tie	1st -Tie	8th	7th	5th
Human intrusion and disturbance	6th	4th	7th	6th - Tie	4th - Tie	5th	5th	6th
Climate change and severe weather	7th	7th	6th	5th	7th	7th	6th	8th
Transportation and service corridors	8th	8th	8th	3rd -Tie	4th - Tie	9th	8th	9th
Other stressors	9th	9th	9th	8th - Tie	8th	6th	10th	7th
Energy production and mining	10th	10th	10th	8th - Tie	11th	11th	9th	11th
Biological resource use	11th	11th	11th	11th	10th	10th	11th	10th

Lowest Ranked Threats

15. You indicated a number of general categories as significant or moderate threats to fish and wildlife habitats within **HABITAT** in the Great Lakes (Region 1). Please indicate which of the following are specific threats to fish and wildlife habitats within HABITAT in the Great Lakes (Region 1).

Invasives and Other Problematic Species/Genes – 1st

Threats from non-native and native plants, animals, pathogens/microbes, or genetic materials that have or are predicted to have harmful effects on biodiversity following their introduction, spread, and/or increase in abundance

- *Invasive/alien species*

Residential and Commercial Development – 2nd

Threats from human settlements or other nonagricultural land uses with a substantial footprint

- *Housing/Urban areas*
- *Commercial and industrial areas*

Natural Systems Modification – 3rd

Threats from human activities that alter, destroy, and disturb habitats and species associated with nonconsumptive uses of biological resources

- *Conversion of natural habitats to other land uses*

Agriculture and Aquaculture – 4th

Threats from farming and ranching as a result of agricultural expansion and intensification, including silviculture, mariculture, and aquaculture

- Conversion of habitat to annual crops
- Annual and perennial nontimber crops

Pollution – 5th

Threats from introduction of exotic and/or excess materials or energy from point and nonpoint sources

- Runoff from roads/service corridors
- Agriculture, residential, and forestry effluents
- Household sewage and urban water waste
- Point source pollution from commercial/industrial sources

Human intrusions and disturbance – 6th

Threats from human activities that alter, destroy, and disturb habitats and species associated with nonconsumptive uses of biological resources.

- *Recreation activities (e.g., ATVs, trail use, horseback riding, high-speed boating, canoeing)*

Climate change and severe weather – 7th

Long-term climactic changes that may be linked to global warming and other severe climactic or weather events outside the natural range of variation that could wipe out vulnerable species or habitat.

- *Shifting and alteration of habitats due to climate change*
- *Changing frequency, duration, and intensity of drought*
- *Temperature extremes*
- *Changing frequency, duration, and intensity of floods*
- *Shifting seasons/phenology*

Transportation and Service Corridors – 8th

Threats from long, narrow transport corridors and the vehicles that use them, including associated wildlife mortality

- *Roads and railroads*

Other stressors – 9th

Additional threats and stressors directly affecting habitats, such as diseases and genetic diversity issues

- *Diseases*

Energy production and mining – 10th

Threats from production of nonbiological resources

Biological Resource Use – 11th

Threats from consumptive use of “wild” biological resources including deliberate and unintentional harvesting effects; also persecution or control of specific species

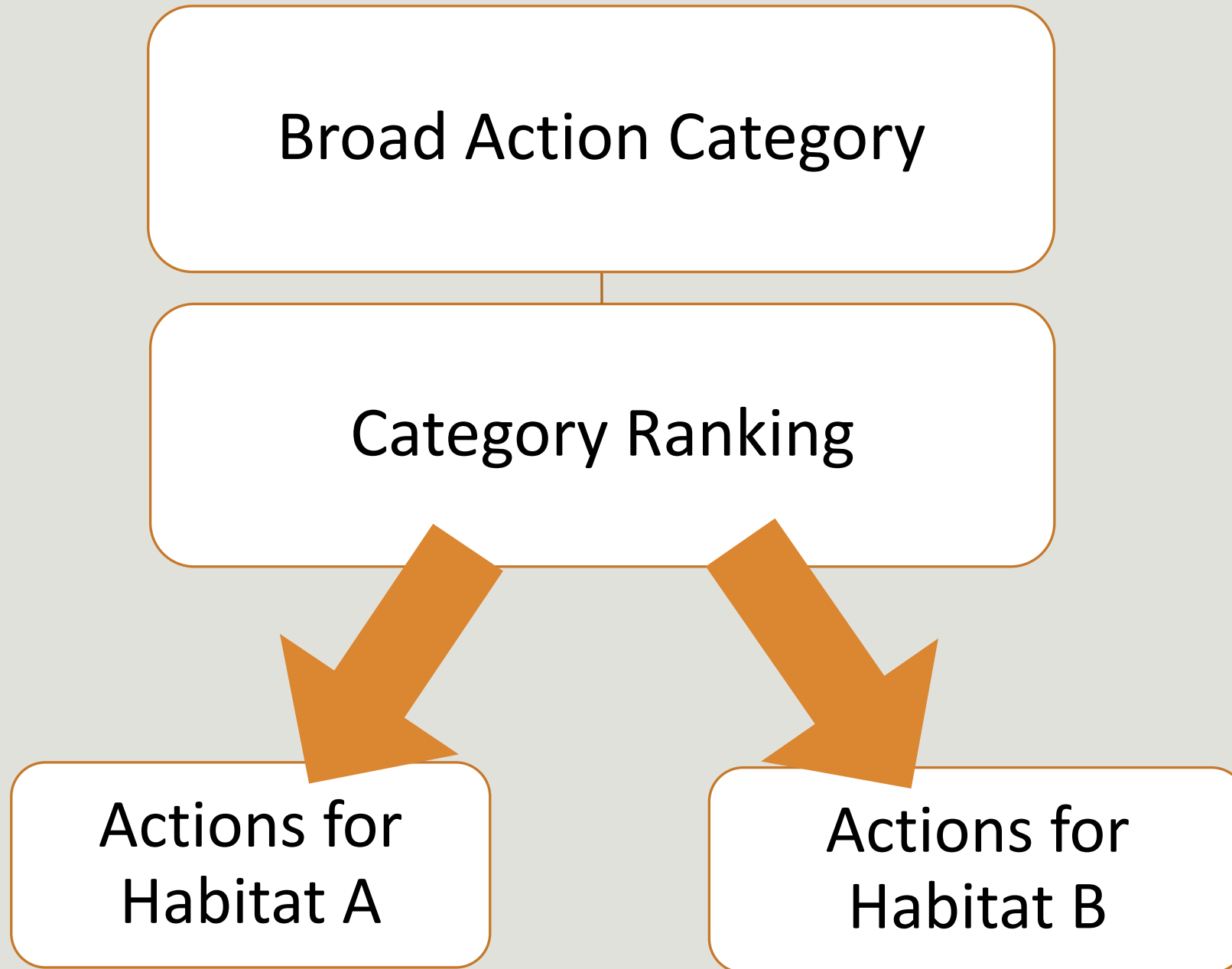
Conservation Actions for Habitats in the Great Lakes (Region 1)

Broad Action Category

Category Ranking

Actions for
Habitat A

Actions for
Habitat B



17. Please indicate the importance of the following general categories of conservation actions for fish and wildlife habitats within **HABITAT** in the Great Lakes (Region 1) over the next 10 years

Action Category:	Rating as “very important” or “moderately important”:	N:
Education and awareness	95.1%	136
Land/water/species management	92.9%	131
Land/water protection	88.3%	128
Law and policy	85.9%	116
Livelihood, economic, and other incentives	83.6%	112
External capacity building	73.3%	99

	Entire Region	Aquatic Systems	Agricultural Lands	Barren Lands	Developed Lands	Forests	Grass- lands	Wet- lands
Education and awareness	1st	1st	1st - Tie	1st - Tie	1st - Tie	1st	3rd	2nd
Land/water/species management	2nd	2nd	1st - Tie	1st - Tie	5th - Tie	2nd - Tie	1st - Tie	3rd
Land/water protection	3rd	3rd	5th	1st - Tie	4th	2nd - Tie	1st - Tie	4th
Law and policy	4th	4th	3rd	3rd - Tie	1st - Tie	6th	6th	1st
Livelihood, economic, and other incentives	5th	5th	4th	3rd - Tie	1st - Tie	4th	4th	5th
External capacity building	6th	6th	6th	3rd - Tie	5th - Tie	5th	5th	6th

	Entire Region	Aquatic Systems	Agricultural Lands	Barren Lands	Developed Lands	Forests	Grass-lands	Wet-lands
Education and awareness	1st	1st	1st - Tie	1st - Tie	1st - Tie	1st	3rd	2nd
Land/water/species management	2nd	2nd	1st - Tie	1st - Tie	5th - Tie	2nd - Tie	1st - Tie	3rd
Land/water protection	3rd	3rd	5th	1st - Tie	4th	2nd - Tie	1st - Tie	4th
Law and policy	4th	4th	3rd	3rd - Tie	1st - Tie	6th	6th	1st
Livelihood, economic, and other incentives	5th	5th	4th	3rd - Tie	1st - Tie	4th	4th	5th
External capacity building	6th	6th	6th	3rd - Tie	5th - Tie	5th	5th	6th

Highest Ranked Action

	Entire Region	Aquatic Systems	Agricultural Lands	Barren Lands	Developed Lands	Forests	Grass-lands	Wet-lands
Education and awareness	1st	1st	1st - Tie	1st - Tie	1st - Tie	1st	3rd	2nd
Land/water/species management	2nd	2nd	1st - Tie	1st - Tie	5th - Tie	2nd - Tie	1st - Tie	3rd
Land/water protection	3rd	3rd	5th	1st - Tie	4th	2nd - Tie	1st - Tie	4th
Law and policy	4th	4th	3rd	3rd - Tie	1st - Tie	6th	6th	1st
Livelihood, economic, and other incentives	5th	5th	4th	3rd - Tie	1st - Tie	4th	4th	5th
External capacity building	6th	6th	6th	3rd - Tie	5th - Tie	5th	5th	6th

Lowest Ranked Action

17. Considering your responsibility within your agency/organization, please indicate whether you have taken a general category of conservation actions for fish and wildlife habitats within **HABITAT** in the **Great Lakes (Region 1)** since 2005 or have plans to do so.

Threat Category:	Rank	Yes		No	
		%	N	%	N
Education and awareness	1st	88.0%	88	12.0%	12
Land/water/species management	2nd	80.6%	79	19.4%	19
Land/water protection	3rd	72.9%	70	27.1%	26
Law and policy	4th	38.1%	32	61.9%	52
Livelihood, economic, and other incentives	5th	38.5%	30	61.5%	48
External capacity building	6th	48.1%	37	51.9%	40

18. Please indicate the importance of the following specific conservation actions within these general categories for fish and wildlife habitats within HABITAT in the Great Lakes (Region 1).

Education and Awareness – 1st

Actions directed at people to improve understanding and skills, and influence behavior.

- *Educational programs in general*
- *Educational programs specifically for K-12*

Land/Water/Species Management – 2nd

Actions directed at conserving or restoring sites, habitats, and the wider environment as well as actions directed at managing or restoring species, focused on the species of concern itself.

- *Control invasive species in HABITAT*
- *Protect adjacent buffer zones*
- *Reduce losses of fish and wildlife habitats (due to agriculture, urban sprawl, commercial development, etc.)*
- *And many others...*

Land/Water Protection – 3rd

Actions to identify, establish, or expand parks and other legally protected areas, and to protect resource rights

- *Preserve currently existing corridors*
- *Acquire currently unprotected HABITAT*

Law and policy – 4th

Actions to develop, change, influence, and help implement formal legislation, regulations, and voluntary standards.

- *Improve compliance with and enforcement of current policies*
- *Increase regulations on invasive species*
- *Reduce urban sprawl through planning and zoning*

Livelihood, economic, and other incentives – 5th

Actions to use economic and other incentives to influence behavior

- *Manage recreational opportunities to be compatible with fish and wildlife habitats*
- *Promote nonmonetary values of natural systems within the state*
- *Support substitution of alternatives for environmentally harmful products and processes*

External capacity building – 6th

Actions to build the infrastructure to do better conservation

- *Promote use of research and science in conservation decision-making processes*
- *Develop alliances and partnerships (e.g., between producers, landowners, and conservation professionals)*
- *Strengthen conservation financing*



The diagram consists of two large, white, arrow-shaped boxes pointing towards each other, meeting at a central point. The left arrow points right and contains the word "Threats". The right arrow points left and contains the words "Conservation Actions". Both arrows have a thin brown outline. The background is a solid light gray.

Threats

**Conservation
Actions**